Update on generator-level trigger studies

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Zbb meeting

Recall…

- Looked at HEPG quantities:
  - stable particles → tracks, b partons → jets.
- Implemented trigger cuts:
  - Z→bb trigger (two-B trigger).
  - B group's "two track trigger" (one-B trigger).
- Found 2.7% eff. for 2-B, 17.3% for 1-B.
- Roughly defined "taggable" as having two fiducial tracks (SVX+COT) > 350 MeV.
- Then 13.1% of evts are doubly-taggable, and of those, 9.8% pass 2-B, 27.8% pass 1-B.

Potential problems with 1-B trigger

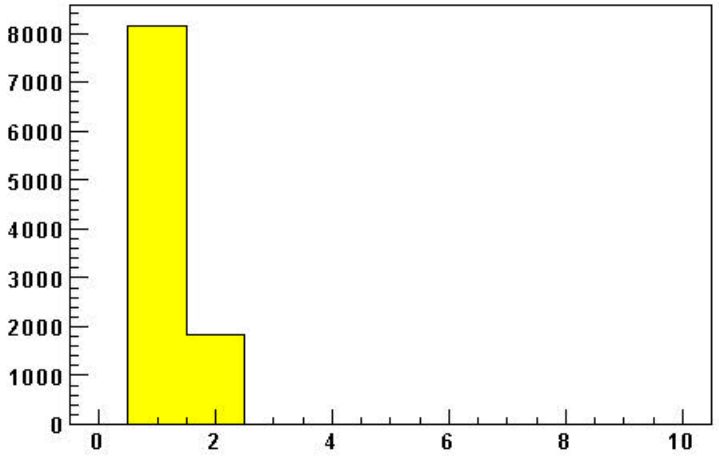
- Could be prescaled at high luminosity.
  - I don't think we can do anything about this. It's going to be up to the B people what they want to do. If it happens it happens.
- How does it affect background shape for $Z \rightarrow bb$ analysis?
  - Where and how sharp is the turn-on rate?
  - How does it compare to 2-B trigger?

Bkgd gen-level sample

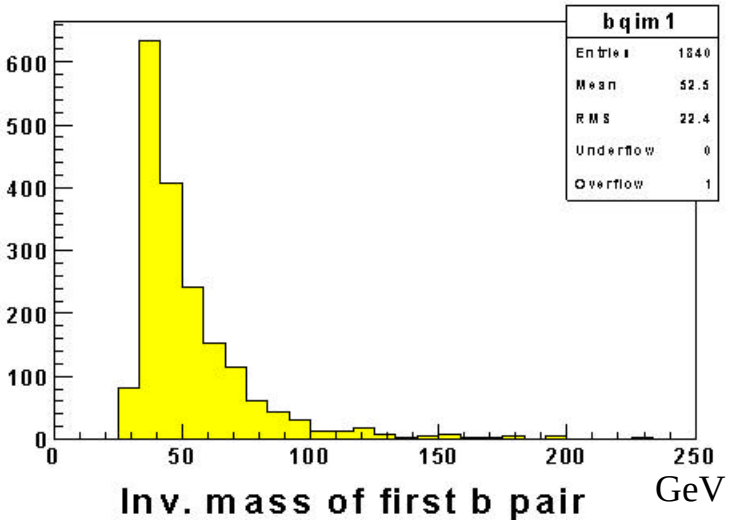
HERWIG processCode = 1705: b production.

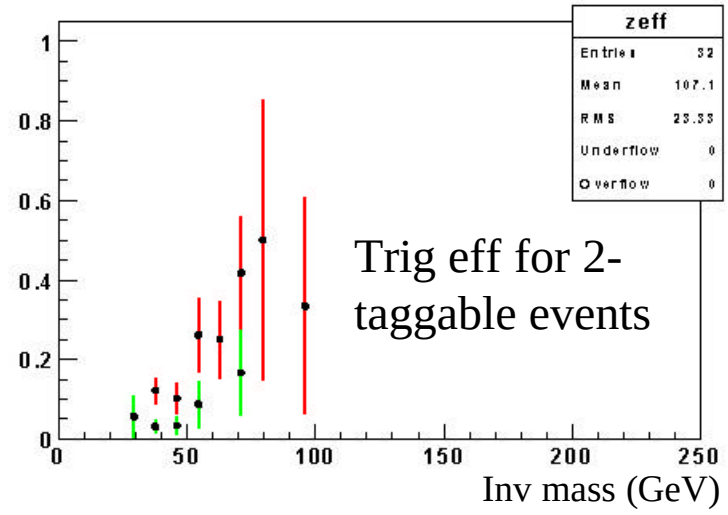
Turns out only ~18% bbbar.

Very quickly falling mass spectrum.



# of b quarks in hard scatter





Trig eff for 2-taggable events

pp→Abb→bbbb study

Pythia tcl from Aaron D.

A^0 mass set to 90 GeV!

BR(A→bb) = 92%.

4 b quarks give you more chances to pass both triggers. But for Z→bb, dPhi>150 hurts.

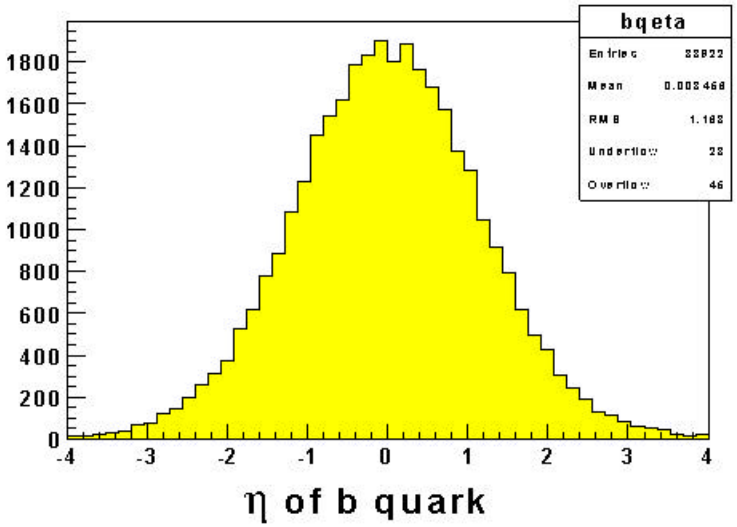
1-B trigger: **83%**

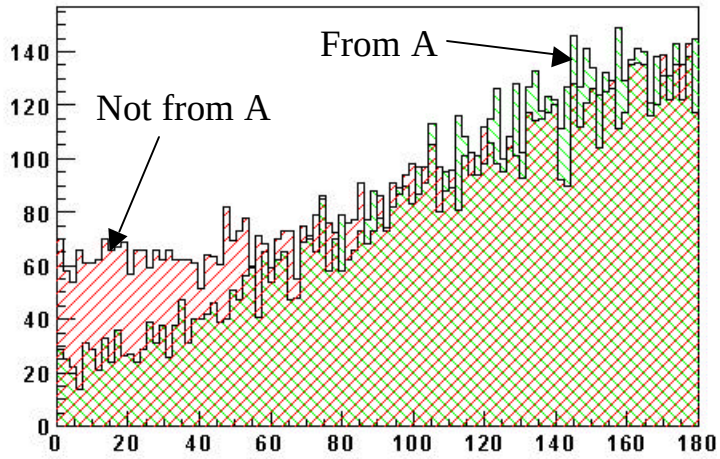
2-B trigger: **40%** (overlap)

Of 2-taggable (**54%**):

1-B: **93%**

2-B: **55%**





dPhi of b quark pairs

Ongoing/Future work

- Generate bb background, flatter spectrum.
- New version of high-pt bjet trig to check?
- Repeat studies with full (realistic) simulation.